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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,982	03/17/2004	Joon-Sung Kim	8054-44 (AW8105US/JY)	3068
22150	7590	03/22/2005		EXAMINER
F. CHAU & ASSOCIATES, LLC				SOUW, BERNARD E
130 WOODBURY ROAD				
WOODBURY, NY 11797			ART UNIT	PAPER NUMBER

2881

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/802,982	KIM ET AL. <i>(Signature)</i>
	Examiner Bernard E. Souw	Art Unit 2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 10 February 2005.  
 2a) This action is FINAL.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-20 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 17 March 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Applicant's Response***

1. Applicant's Response filed on 02/10/2005 has been entered. The present Office Action is made with all the remarks being fully considered.

No claim has been amended, cancelled, or added.

Claims 1-20 remain pending in this office action.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-11 and 13-20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Lischke et al. (USPAT 4,677,296).

Lischke et al. disclose a method for measuring dimensions of minute structures, as recited in the Abstract/lines1-2, Col.4/ll.12-36 and Col.5/ll.33-63, the method comprising the steps of: irradiating primary electrons PE shown in Fig.1 onto the minute structures P, shown in more details in Fig.2), as recited in Col.4/ll.12-14 and 54-60; providing image data of the minute structures shown in Fig.3 by detecting secondary electrons SE generated from the minute structures P by detector D shown in Fig.1, as recited in Col.4/ll.60-62; determining at least two measuring regions over the minute structures using the image data, as

recited in Col.4/II.62-68 and Col.5/II.1-11+21-32+39-63; and calculating dimensions of the minute structures measuring regions corresponding to the measuring regions, as recited in Col.5/II.22-25 and Col.5/II.33-63, especially Col.5/II.49-53.

► The above recited steps of Lischke's method clearly anticipate the present claims 1, 4, 6-9, 13 and 16-20, with more details as follows:

- Specifically regarding claims 6 and 15, the step of providing the image data by converting the secondary electrons SE into current signals is inherent in Lischke's, as implicated in Col.4/II.26-30.
- Specifically regarding claims 7, 16, 17 and 20, the step of determining the measuring regions by mapping a movable boundary along an X-axis and a Y-axis with the image on the monitor, and transmits the coordinate values of the measuring regions to the operation member (claim 16); the step of calculating the dimensions of the minute structures, correlating the image data to the measuring region, and transmitting the data to the monitor display and the storage member R (claim 17), are all inherent in Lischke's, as recited in Col.5/II.33-63; wherein the storage member is expressly recited in Col.5/II.5-10 and the operation member (including a computer) for calculating dimensions is recited in Col.5/II.9-32.
- Specifically regarding claim 8, the step of correlating the image data to the measuring regions is inherent in Lischke's, as recited in Col.5/II.3-63.
- Specifically regarding claims 9 and 13, Lischke's method makes use of an electron emission member, i.e., the electron source E shown in Fig.1; a display member (not shown in figure drawing) that displays an SEM image shown Fig.2,

formed by detecting secondary electrons from the minute structures on P of Fig.1, as recited in Col.4/II.51-58 and col.8/II.4-8, the display member determining at least two measuring regions over the minute structures of Fig.2, as inherently implicated in Col.5/II.3-11 and Col.5/II.21-26, and even includes a 2-dimensional image, as expressly recited in Col.5/II.33-63, especially in Col.5/II.49-53; a storage member R as part of signal processing system, as recited in Col.5/II.5-11; and an operation member (including a computer) for calculating dimensions of the minute structures and transmits the data to the display member, as recited in Col.5/II.9-32, wherein the steps of calculations is recited in Col.5/II.49-33.

- Claims 18 and 19 recite the same limitations as claim 1, which has been previously rejected.
- ▶ Regarding claims 2 and 10, the limitation that the minute structures comprise a line, a hole, a trench, or a space, or a combination thereof, formed on semiconductor substrate P, is inherent in Lischke's, as shown in Fig.2 & 4 and recited in Col.4/II.49-68 and Col.5/II.1-63.
- ▶ Regarding claims 3 and 11, the step of synchronizing the primary electrons to scan the minute structure P is inherent in all scanning electron microscopes (SEMs), as recited in Col.4/II.58-61 and Col.5/II.41-47.
- ▶ Regarding claim 5, the step of storing the image data in a storage member is recited in Col.4/II.54-58, Col.5/II.7-11, whereas the storage member R is specifically recited in Col.5/II.5-11.
- ▶ Regarding claim 14, Lischke's image processing device R is for generating the image data on a monitor (not shown in Lischke's figure drawings),

as recited in Col.4/II.51-58, Col.5/II.7-11 and Col.8/II.4-8, whereas Lischke's controller for determining the measuring regions is connected to the operation member, as implicated in Col.5/II.7-63, more specifically in Col.5/II.22-25 & II.39-49.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lischke et al. in view of Vahala et al. (USPAT 4,929,041) or Wagner et al. (USPAT 5,659,172).

Lischke et al. show all the limitations of claim 12, as previously applied to claims 1 and 9 in combination, further including an electron gun E shown in Fig.1; a magnetic lens (part of the objective lens O) for focusing the primary electrons, as recited in Col.4/II.24-26; a scanning coil A for synchronizing the primary electrons, as recited in Col.4/II.14-24; a (second) electron detector for detecting secondary electrons SE, as recited in Col.4/II.26-31.

However, Lischke et al. do not teach to use a (first) electron detector for detecting primary electrons that have been scattered from the minute structure.

The use of such a detector is taught by Vahala et al. as recited in Col.2/II.1-6, or, in the alternative, by Wagner et al. in Col.4/II.35-38.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add to Lischke's method and/or apparatus a separate detector for detecting primary electrons that have been scattered from the minute structure, as taught by Vahala et al. or Wagner et al., in order to generate an image which is sensitive to variations in the material composition of the surface, as suggested by Vahala et al. in Col.2/II.1-6.

***Final Rejection***

4. No new ground of rejection has been made. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP §706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

## **RESPONSE TO APPLICANT'S ARGUMENTS**

5. Regarding the previous rejections of claims 1 and 9, Applicant's allegation that Lischke does not disclose "*determining at least two measuring regions over the minute structures*" is not true, since Lischke's method determines a whole bunch of such minute structures over a 2-dimensional image, as recited in Col.5/II.3-11 and expressly recited in Col.5/II.21-26, wherein the 2-dimensional imaging is expressly recited in Col.4/line 15.

Applicant's further allegation that Lischke does not disclose "*calculating dimensions of the minute structures corresponding to the measuring regions*" is also not true, since the limitation is recited in Col.5/II.33-63. Lischke even expressly recites the method and formula for calculating the dimensions in Col.5/II.49-53.

Thus, Lischke does disclose all the limitations of claims 1, 9, and 18, and consequently, also claims 2-8, 10-11, 13-17 and 19-20.

6. Regarding the rejection of claim 12, Applicant's argument, there is no suggestion or motivation to modify Lischke's by Vahala's or Wagner's by additionally detecting backscattered electrons, it is noted that such motivation has been clearly recited in the previous office action on page 5/lines 1-4 from bottom and on page 6/lines 1-2. More specifically, Vahala teaches that the purpose of detecting backscattered electrons is "*to generate an image which is sensitive to variations in material composition of the surface*", as recited in Col.2/II.1-6.

7. None of Applicant's arguments against the examiner's rejections of claims 1-20 is considered persuasive. All the previous rejections are thus proper.

#### ***Relevant Prior Arts***

8. These prior arts made of record and not relied upon are considered pertinent to applicant's disclosure: (a) USPAT # 5,523,568, issued on 06/04/1996 to Ichikawa et al., (b) USPAT # 4,933,565, issued on 06/12/2990 to Yamaguchi et al., and (c) USPAT # 5,659,174, issued on 08/19/1997 to Kaneoka et al., disclose the same subject matter as the present disclosure; they are therefore clearly anticipating the same claims under 35 U.S.C. § 102(b). Similarly, prior art references (d) USPAT # 6,753,518, issued to Watanabe et al. on 06/22/2004, and (e) US-PGPUB # 2004/0217287, also issued to Watanabe et al. on 06/22/2004, disclose the same subject matter. As such, they, too, are clearly anticipating the same claims under 35 U.S.C. § 102(a) and 102(e).

#### ***Communications***

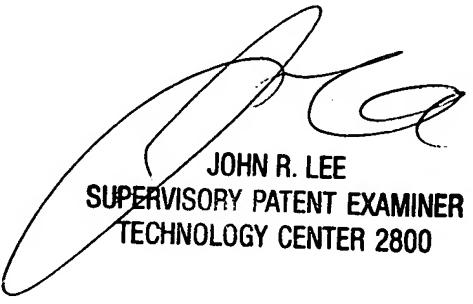
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The

central fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes  
March 7, 2005



JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
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